UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/401,740	09/23/99	MALHOTRA S	D/99532

IM52/1023

JOHN E BECK
XEROX CORPORATION
XEROX SQUARE 20A
ROCHESTER NY 14644

EXAMINER	
SHOSHO, C	
ART UNIT	**PAPER NUMBER**
1714	13

DATE MAILED: 10/23/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER OF
PATENTS AND TRADEMARKS
Washington, D.C. 20231

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 13

Application Number: 09/401,740
Filing Date: 9/23/99
Appellant(s): Shadi L. Malhotra

Judith L. Byorick
For Appellant

EXAMINER'S ANSWER

This is in response to appellant's brief on appeal filed 8/3/01.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The brief includes a statement that claims 1-22 do not stand or fall together, but fails to present reasons in support thereof as required under 37 CFR 1.192(c)(5). MPEP § 1206.

(8) Claims Appealed

A substantially correct copy of appealed claims 1-21 appears on pages 77-84 of the Appendix to the appellant's brief. The minor errors are as follows: Appellant has not included claim 22 which is pending in the application. Claim 22 recites:

"A hot melt ink composition consisting of (a) a styrene polymer or terpene polymer hardening component, (b) a nonpolymeric aromatic viscosity modifier, (c) a colorant, (d) an optional nonpolymeric aromatic viscosity modifier, (e) an optional colorant dispersing agent, (f) an optional conductivity enhancing agent, (g) an optional antioxidant, and (h) an optional UV absorber."

(9) Prior Art of Record

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal. The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

5,279,655	Takazawa et al.	1-1994
6,022,910	Nishizaki et al.	2-2000

5,286,288	Tobias et al.	2-1994
4,684,956	Ball	8-1987
5,270,730	Yaegashi et al.	12-1993
5,397,388	Fujioka	3-1995
5,531,816	Wickramanayake	7-1996
5,922,117	Malhotra et al.	7-1999
6,106,599	Breton et al.	8-2000
6,028,180	Shawcross et al.	2-2000
5,015,292	Bruder et al.	5-1991
5,902,390	Malhotra et al.	5-1999
6,045,607	Breton et al.	4-2000
JP 06228476	Shimomura	8-1994

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 1-2, 4, 8, 12-14, 16, and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takazawa et al. (U.S. 5,279,655).

Takazawa et al. disclose a solid ink having melting point of 50^0-150^0 C wherein the ink contains polystyrene, 10-20% dispersant, 10-40% colorant such as dyes, 20-30% aromatic viscosity modifier, and 20-60% ink vehicle (col.1, lines 24-25, col.3, line 27, col.6, lines 46-50, col.7, lines 20-29, col.8, lines 19-21 and 32-33).

Although there is no explicit disclosure that the polystyrene functions as a hardening component, given that the resins are identical to those presently claimed, it is clear that polystyrene functions inherently as a hardening component.

The difference between Takazawa et al. and the present claimed invention is the requirement in the claims of (a) specific type of styrene polymer and (b) time required to change ink from solid state to liquid state.

With respect to difference (a), the present claims require a styrene polymer such as poly(α-methyl styrene). Takazawa et al. broadly disclose the use of polystyrene. However, one of ordinary skill in the art would have recognized that the broad disclosure of polystyrene in the Takazawa et al. encompasses the use of poly(α-methyl styrene), and that the choice of poly(α-methyl styrene) as the particular styrene resin would have been within the bounds of routine experimentation.

With respect to difference (b), although there is no explicit disclosure of the time required to change the ink from a solid state to a liquid state, given that the reference ink and the presently claimed have almost identical melting temperatures, it is clear that the reference ink will inherently change from solid to liquid in the same amount of time as presently claimed.

2. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takazawa et al. as applied to claims 1-2, 4, 8, 12-14, 16, and 21-22 above, and further in view of Nishizaki et al. (U.S. 6,022,910).

The difference between Takazawa et al. and the present claimed invention is the requirement in the claims of melt viscosity.

Takazawa et al. disclose the use of viscosity modifiers, but do not explicitly disclose the melt viscosity of the ink.

Nishizaki et al., which is drawn to hot melt inks, discloses that the melt viscosity of hot melt inks must be adjusted to range from 10 cPs to 60 cPs to prevent faulty ejection and clogging of the ink jet printer heads (col.3, lines 10-19).

In light of the above, it would have been within the skill level of one of ordinary skill in the art to adjust the viscosity of the hot melt ink of Takazawa et al. to values, including those presently claimed, in order to prevent faulty ejection and clogging of the ink jet printer heads, and thereby arrive at the claimed invention.

3. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takazawa et al. as applied to claims 1-2, 4, 8, 12-14, 16, and 21-22 above, and further in view of Tobias et al. (U.S. 5,286,288).

The difference between Takazawa et al. and the present claimed invention is the requirement in the claims of conductivity.

Tobias et al., which is drawn to hot melt inks, discloses the use of conductivity agents in order to control the conductivity of the ink from 500-1500 microsiemens/cm or approximately

5.7-6.2 log(picomho/cm) which ensures that the ink has sufficient conductivity in order to be successfully ink jet printed (col.3, line 19).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to control the conductivity of the hot melt of Takazawa et al. via conductivity agents in order to produce an suitable for ink jet printing, and thereby arrive at the claimed invention.

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takazawa et al. as applied to claims 1-2, 4, 8, 12-14, and 16 above, and further in view of Ball (U.S. 4,684,956).

The difference between Takazawa et al. and the present claimed invention is the requirement in the claims of the amount of polystyrene.

Takazawa et al. disclose a hot melt ink containing polystyrene, but do not explicitly disclose the amount of polystyrene present.

Ball, which is drawn to hot melt inks, discloses the use of 25-55% polystyrene in order to enhance the adhesion of the ink to substrate (col.3, lines 60-61 and 66-67 and col.3, line 58).

In light of the motivation for using specific amount of polystyrene disclosed by Ball as described above, it therefore would have been obvious to one of ordinary skill in the art to use polystyrene in this amount in the hot melt ink of Takazawa et al. in order to produce an ink with enhanced substrate adhesion, and thereby arrive at the claimed invention.

5. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takazawa et al. as applied to claims 1-2, 4, 8, 12-14, 16, and 21-22 above, and further in view of Yaegashi et al. (U.S. 5,270,730), Wickramanayake (U.S. 5,531,816), Malhotra et al. (U.S. 5,922,117), and Breton et al. (U.S. 6,106,599).

The difference between Takazawa et al. and the present claimed invention is the requirement in the claims of specific type of viscosity modifier.

Yaegashi et al., which is drawn to hot melt inks, discloses the use of heat fusible substances such as dibenzofuran and 4-methylbiphenyl in order to produce an ink with excellent dischargeability, storability, and little blotting (col.10, lines 59 and 64 and col.11, lines 7-13).

Wickramanayake, which is drawn to ink jet inks, discloses the use of phenanthrene as a solvent for the colorant, and to prevent crust formation and nozzle clogging in the printer (col.5, lines 20-33 and 51). Although there is no disclosure of other specific types of phenanthrene, one of ordinary skill in the art would have recognized that the broad disclosure of phenanthrene encompasses the use of specific types of phenanthrene such as those presently claimed, and that the choice of these specific types of phenanthrene would have been within the bounds of routine experimentation.

Malhotra et al., which is drawn to hot melt inks, discloses the use of 1-adamantane ethanol in order to ensure that the ink has low acoustic loss in order to minimize or reduce energy consumption of the printer and to generate high quality, lightfast, and waterfast images (col.1, lines 43-48).

Breton et al. '599, which is drawn to hot melt ink, disclose the use of phenylsulfonyl compound in order to adjust the viscosity of the ink (col.7, lines 24-25).

In light of the motivation for using dibenzofuran, 4-methylbiphenyl, phenanthrene, 1-adamantane ethanol, and phenylsulfonyl compound disclosed by Yaegashi et al., Wickramanayake, Malhotra et al., and Breton et al. '599 as described above, it therefore would have been obvious to one of ordinary skill in the art to use these compounds in the hot melt ink of Takazawa et al. in order to produce a workable ink with excellent dischargeability, storability, little blotting which minimizes energy use with regards to the printer and does not clog the printer nozzles, and thereby arrive at the claimed invention.

6. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takazawa et al. as applied to claims 1-2, 4, 8, 12-14, 16, and 21-22 above, and further in view of Shawcross et al. (U.S. 6,028,180) and Bruder et al. (U.S. 5,015,292).

The difference between Takazawa et al. and the present claimed invention is the requirement in the claims of specific type of ink vehicle.

Bruder et al., which is drawn to ink jet inks, discloses the use of solvents such as carboxamide in order to enhance waterfastness and smear resistance (col.1, lines 20-29 and col.3, line 29).

Shawcross et al., which is drawn to ink jet inks, discloses the use of solvent such as tetrahydronaphthalene (col.9, lines 37-38).

Shawcross et al. and Bruder et al. broadly disclose tetrahydronaphthalene and carboxamide, respectively. Although there are no specific examples of tetrahydronaphthalenes and carboxamides in either of these references, one of ordinary skill in the art would have recognized that the broad disclosure of tetrahydronaphthalene and carboxamide encompasses the use of specific types of tetrahydronaphthalene and carboxamide such as those presently claimed, and that the choice of these specific types of tetrahydronaphthalene and carboxamide would have been within the bounds of routine experimentation.

In light of the motivation for using specific types of ink vehicles disclosed by Shawcross et al. and Bruder et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use these ink vehicles as the vehicle in the ink of Takazawa et al., in order to produce an ink with enhanced waterfastness and smear resistance.

7. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takazawa et al. as applied to claims 1-2, 4, 8, 12-14, and 16 above, and further in view of JP 06228476, Yaegashi et al. (U.S. 5,220,730), and Malhotra et al. (U.S. 5,902,390).

The difference between Takazawa et al. and the present claimed invention is the requirement in the claims of specific type of dispersing agent.

JP 06228476, which is drawn to ink jet inks, discloses the use of 2-oxazolidone in order to produce an ink with excellent humectant properties and discharge stability.

Yaegashi et al., which is drawn to hot melt inks, discloses the use of diphenyl carbonate, glutaric acid, and 1,3-diphenyl-1,3-propanedione in order to produce an ink with excellent dischargeability, storability, and little blotting (col.10, lines 52, 58, and 62 and col.11, lines 7-13). Although there is no specific examples of glutaric acids, one of ordinary skill in the art would have recognized that the broad disclosure of glutaric acid by Yaegashi et al. encompasses the use of specific types of these compounds such as those presently claimed, and that the choice of these specific types would have been within the bounds of routine experimentation.

Malhotra et al. '390, which is drawn to hot melt inks, discloses the use cyclohexanedione in order to control the acoustic-loss value of the ink (col.1, lines 37 and 42-43 and col.5, lines 7 and 13). While the present claims disclose the use of 4,4-dimethyl-1,3-cyclohexanedione and Malhotra et al. '390 disclose the use of 1,2-cyclohexanedione, the only difference between the two compounds is the position of the substituent, i.e. 1,2-cyclohexanedione vs. 1,3-cyclohexanedione, and the presence of a dimethyl substituent. However, absent any evidence of criticality, one of ordinary skill in the art would expect the cyclohexanedione to function in the same manner regardless of the position of the substituent or the presence of the dimethyl group.

In light of the motivation for using 2-oxazolidone, diphenyl carbonate, glutaric acid, 1,3-diphenyl-1,3-propanedione, and cyclohexanedione disclosed by JP 06228476, Yaegashi et al., and Malhotra et al. '390 as described above, it therefore would have been obvious to one of ordinary skill in the art to use compounds in the hot melt ink of Takazawa et al. in order to

produce an ink with suitable acoustic-loss value, excellent humectant properties and discharge stability, and thereby arrive at the claimed invention.

8. Claims 1-5, 7-9, 13, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breton et al. '607 (U.S. 6,045,607) in view of Takazawa et al. (U.S. 5,279,655), Ball (U.S. 4,684,956), and Fujioka (U.S. 5,397,388).

Breton et al. '607 discloses a hot melt ink possessing melting temperature of 60^0-150^0 C, melt viscosity of less than 10 cP, acoustic-loss value of 5-40 dB/mm, haze value of 10-30 wherein the ink changes from solid to liquid in about 1-100 milliseconds (col.2, lines 12-17, 25-29, and 45, col.3, lines 18-20, col.6, lines 1-2, and col.16, lines 8-53). The ink contains colorant such as a dye, antioxidant, and UV absorber (col.2, lines 45-47). There is also disclosed an acoustic ink jet printing process (col.16, lines 8-53).

The difference between Breton et al. '607 and the present claimed invention is the requirement in the claims of (a) styrene or terpene resin and (b) aromatic viscosity modifier.

With respect to difference (a), Takazawa et al., which is drawn to hot melt inks, discloses the use of polystyrene in order to produce a solid ink (col.8, lines 1-6 and 21).

Ball, which is drawn to hot melt inks, discloses the use of 22-55% polyterpenes and methyl styrenes in order to enhance the adhesion of the ink so the substrate (col.3, lines 58, 60-61, and 66-67).

Fujioka, which is drawn to hot melt inks, discloses the use of 0.1-48% terpene resins and cumarone-indene resins in order to provide the ink high transparency, controlled hardness, and good wear resistance (col.3, lines 51-58 and col.4, lines 23-24).

Although Takazawa et al., Ball, or Fujioka do not explicitly disclose that the styrene/terpene resins function as hardening components, given that the resins are identical to those presently claimed, it would be natural for one of ordinary skill in the art to infer that these reference styrene/terpene resins intrinsically function as hardening components.

In light of the motivation for using styrene/terpene resin disclosed by Takazawa et al., Ball, and Fujioka as described above, it therefore would have been obvious to one of ordinary skill in the art to use these resins in the hot melt ink of Breton et al.'607 in order to produce a solid ink that has enhanced substrate adhesion, ink high transparency, controlled hardness, and good wear resistance, and thereby arrive at the claimed invention.

With respect to difference (b), Takazawa et al. discloses the use of aromatic viscosity modifiers (col.7, lines 3 and 26-27) in order to control the viscosity of the ink so that the printer nozzles are not clogged.

In light of the motivation for using viscosity modifier disclosed by Takazawa et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use viscosity modifier in the ink of Breton et al. '607 in order to produce an ink that does not clog the printer nozzles, and thereby arrive at the claimed invention.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Breton et al. '607 in view of Takazawa et al., Ball, and Fujioka as applied to claims 1-5, 7-8, 13, and 18-20 above, and further in view of Tobias et al. (U.S. 5,286,288).

The difference between Breton et al. '607 in view of Takazawa et al., Ball, and Fujioka and the present claimed invention is the requirement in the claims of conductivity.

Tobias et al., which is drawn to hot melt inks, discloses the use of conductivity agents in order to control the conductivity of the ink from 500-1500 microsiemens/cm or approximately 5.7-6.2 log(picomho/cm) which ensures that the ink has sufficient conductivity in order to be successfully ink jet printed (col.3, line 19).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to control the conductivity of the hot melt of Breton et al. '607 via conductivity agents in order to produce an suitable for ink jet printing, and thereby arrive at the claimed invention.

10. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breton et al.'607 in view of Takazawa et al., Ball, and Fujioka as applied to claims 1-5, 7-8, 13, and 18-20 above, and further in view of Yaegashi et al. (U.S. 5,270,730), Wickramanayake (U.S. 5,531,816), Malhotra et al. (U.S. 5,922,117), and Breton et al. '599 (U.S. 6,106,599).

The difference between Breton et al.'607 in view of Takazawa et al., Ball, and Fujioka and the present claimed invention is the requirement in the claims of specific type of viscosity modifier.

Yaegashi et al., which is drawn to hot melt inks, discloses the use of heat fusible substances such as dibenzofuran and 4-methylbiphenyl in order to produce an ink with excellent dischargeability, storability, and little blotting (col.10, lines 59 and 64 and col.11, lines 7-13).

Wickramanayake, which is drawn to ink jet inks, discloses the use of phenanthrene as a solvent for the colorant, and to prevent crust formation and nozzle clogging in the printer (col.5, lines 20-33 and 51). Although there is no disclosure of other specific types of phenanthrene, one of ordinary skill in the art would have recognized that the broad disclosure of phenanthrene encompasses the use of specific types of phenanthrene such as those presently claimed, and that the choice of these specific types of phenanthrene would have been within the bounds of routine experimentation.

Malhotra et al., which is drawn to hot melt inks, discloses the use of 1-adamantane ethanol in order to ensure that the ink has low acoustic loss in order to minimize or reduce energy consumption of the printer and to generate high quality, lightfast, and waterfast images (col.1, lines 43-48).

Breton et al. '599, which is drawn to hot melt ink, disclose the use of phenylsulfonyl compound in order to adjust the viscosity of the ink (col.7, lines 24-25).

In light of the motivation for using dibenzofuran, 4-methylbiphenyl, phenanthrene, 1-adamantane ethanol, and phenylsulfonyl compound disclosed by Yaegashi et al., Wickramanayake, Malhotra et al., and Breton et al. '599 as described above, it therefore would have been obvious to one of ordinary skill in the art to use these compounds in the hot melt ink

of Breton et al. '607 in order to produce a workable ink with excellent dischargeability, storability, little blotting which minimizes energy use with regards to the printer and does not clog the printer nozzles, and thereby arrive at the claimed invention.

11. Claim 16-17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Breton et al.'607 in view of Takazawa et al., Ball, and Fujioka as applied to claims 1-5, 7-8, 13, and 18-20 above, and further in view of JP 06228476, Yaegashi et al. (U.S. 5,220,730), and Malhotra et al. (U.S. 5,902,390).

The difference between Breton et al. '607 in view of Takazawa et al., Ball, and Fujioka and the present claimed invention is the requirement in the claims of specific type of dispersing agent.

JP 06228476, which is drawn to ink jet inks, discloses the use of 2-oxazolidone in order to produce an ink with excellent humectant properties and discharge stability.

Yaegashi et al., which is drawn to hot melt inks, discloses the use of diphenyl carbonate, glutaric acid, and 1,3-diphenyl-1,3-propanedione in order to produce an ink with excellent dischargeability, storability, and little blotting (col.10, lines 52, 58, and 62 and col.11, lines 7-13). Although there is no specific examples of glutaric acids, one of ordinary skill in the art would have recognized that the broad disclosure of glutaric acid by Yaegashi et al. encompasses the use of specific types of these compounds such as those presently claimed, and that the choice of these specific types would have been within the bounds of routine experimentation.

Malhotra et al. '390, which is drawn to hot melt inks, discloses the use cyclohexanedione in order to control the acoustic-loss value of the ink (col.1, lines 37 and 42-43 and col.5, lines 7 and 13). While the present claims disclose the use of 4,4-dimethyl-1,3-cyclohexanedione and Malhotra et al. '390 disclose the use of 1,2-cyclohexanedione, the only difference between the two compounds is the position of the substituent, i.e. 1,2-cyclohexanedione vs. 1,3-cyclohexanedione, and the presence of a dimethyl substituent. However, absent any evidence of criticality, one of ordinary skill in the art would expect the cyclohexanedione to function in the same manner regardless of the position of the substituent or the presence of the dimethyl group.

In light of the motivation for using 2-oxazolidone, diphenyl carbonate, glutaric acid, and 1,3-diphenyl-1,3-propanedione, and cyclohexanedione disclosed by JP 06228476, Yaegashi et al., and Malhotra et al. '390 as described above, it therefore would have been obvious to one of ordinary skill in the art to use compounds in the hot melt ink of Breton et al. '607 in order to produce an ink with suitable acoustic-loss value, excellent humectant properties and discharge stability, and thereby arrive at the claimed invention.

(11) Response to Argument

1. Present claim 1 is drawn to hot melt ink composition comprising (a) a styrene polymer or terpene polymer hardening component, (b) a nonpolymeric aromatic viscosity modifier, (c) a colorant, and (d)-(h) several optional ingredients including nonpolymeric aromatic ink

vehicle, colorant dispersing agent, conductivity enhancing agent, antioxidant, and UV absorber.

As background information, it is noted that in the art "hot melt ink" (as in the claims) is identical to "solid ink" (as in Takazawa et al.).

(i) Takazawa et al. disclose hot melt ink comprising polystyrene, nonpolymeric aromatic viscosity modifier such as dioctyl phthalate, and colorant.

The only "deficiency" of Takazawa et al. is that there is no disclosure that the polystyrene functions as a hardening agent. However, given that Takazawa et al. disclose polystyrene identical to that presently claimed, it is clear that the polystyrene of Takazawa et al. would intrinsically function as a hardening component.

Appellant argues that the nonpolymeric aromatic viscosity modifier disclosed by Takazawa et al. is for use in liquid ink not solid ink.

However, col.7, lines 65-68 of Takazawa et al. disclose that "conventional vehicles and others can be used without particular change.." which Examiner contends refers to the liquid inks previously mentioned by Takazawa et al. in col.6, lines 43-51. Appellant argues that the cited recitation in col. 7 refers to other conventional solid inks. However, it is noted that col.8, lines 1-6, 29-31 and col.9, line 48 of Takazawa et al. disclose that solid inks contain vehicle, colorant, dispersing agent, and phthalates which are also disclosed by Takazawa et al. as ingredients used in liquid ink. Thus, from Takazawa et al. it is concluded that there is

overlap with respect to the ingredients used in liquid ink and solid ink. Further, there is no disclosure that the viscosity modifiers are excluded from the solid ink.

Additionally, and even more significantly, it is noted that col.9, lines 41-48 of Takazawa et al. disclose that the solid ink composition contains plasticizing agents such as dioctyl phthalate. It is significant to that these compounds are identical to the viscosity modifiers disclosed in col.7, lines 7-8 of Takazawa et al., i.e. the plasticizing agents clearly function as viscosity modifiers, so it would have been obvious to one of ordinary skill in the art that the solid ink of Takazawa et al. does contain nonpolymeric aromatic viscosity modifier as presently claimed.

Appellant argues that the fact that certain materials would function as viscosity adjusting agents in a liquid ink provides no suggestion that the same material would also function as viscosity adjusting agent in a solid ink.

However, regardless of what the nonpolymeric aromatic compound disclosed by Takazawa et al. is called, the fact remains that the solid ink of Takazawa et al. does in fact contain a nonpolymeric aromatic compound and thus, Takazawa et al. clearly meets the limitations of claim 1.

Appellant further argues that the burden of establishing a case of obviousness rests with the Examiner and that the Examiner may not make an assertion, unsupported by facts, of unpatentability, and require Appellant to provide evidence to rebut this assertion.

However, given that col.8, line 21, col.9, lines 47-48, and col.7, line 67 of Takazawa et al. disclose a solid ink comprising polystyrene, nonpolymeric aromatic compound, and colorant, it is the Examiner's position that a prima facie case of obviousness has clearly been established.

(ii) In an alternative rejection, Examiner also rejected claim 1 using Breton et al. '607 in view of Takazawa et al., Ball, and Fujioka. Appellant argues that although Breton et al.'607 discloses hot melt ink with the same properties, i.e. haze value, acoustic-loss value, and melt viscosity, and optional additives as presently claimed, Breton et al. '607 is a completely different composition than presently claimed and thus, there is no motivation to combine Breton et al. '607 with Takazawa et al., Ball, and Fujioka which teach styrene or terpene polymer and nonpolymeric aromatic viscosity modifier as presently claimed.

However, given that Breton et al. '607 is drawn to hot melt ink, is open to the inclusion of other ingredients, and does not negate the use of polymer or viscosity modifier and further given that there is motivation to combine Takazawa et al., Ball, and Fujioka with Breton et al. '607 as described in paragraph 8 of Grounds of Rejection, it is the Examiner's position that the combination is proper.

2. With respect to claim 8, which requires that the ink comprise specific types of styrene polymers, i.e. poly(α-methyl styrene), Appellant argues that there is nothing in Takazawa et al. which teaches or suggests a hot melt, i.e. solid, ink containing these materials.

However, one of ordinary skill in the art would have recognized that the broad disclosure of polystyrene encompasses the use of, for instance, poly(α-methyl styrene), and that the choice of poly(α-methyl styrene) would have been within the bounds of routine experimentation.

Further, applicant has provided no evidence of criticality regarding the specific type of polystyrene.

3. With respect to present claim 4 which requires that the ink undergoes, upon heating, a change from solid state to liquid state in a period of no more than about 100 milliseconds, Appellant argues that although Takazawa et al. disclose a hot melt ink which possesses the same melting point as presently claimed, melting point and melting time are entirely different and that two materials with the same melting point can have substantially different melt times.

However, it is the Examiner's position that while melting point and melt time are different in that the former is measured in degrees and the latter is measured in time, given that, upon heating, the time required for the ink to change from a solid to a liquid would necessarily depend on both the melting point of the ink as well as the ink itself, and given that Takazawa et al. disclose an ink possessing not only the same melting point but also containing

the same ingredients as presently claimed, the ink must intrinsically possess the same melt time as presently claimed.

Appellant further argues that the functional language of claim 4 must not be ignored, In re Caldwell, 319 F.2d 254, 138 USPQ 243 (CCPA 1963), In re Swinehart, 439 F.2d 210, 169 USPQ 226 (CCPA 1971).

However, Examiner never stated that functional language is improper or should be ignored. Rather, Examiner's position is that given that Takazawa et al. disclose ink as presently claimed, the ink would intrinsically possess the same melt time as presently claimed.

4. With respect to claim 3, which requires that the ink possess specific melt viscosity, Appellant argues that it is improper to combine Takazawa et al. with Nishizaki et al. in order to teach the claimed viscosity given that Nishizaki et al. teach a different composition than presently claimed.

However, it is the Examiner's position that to the extent that Nishizaki et al. teach that hot melt inks with synthetic resin and additives possess melt viscosity of 10-60 cPs so as to prevent faulty ejection and clogging of ink jet printer heads, Nishizaki et al. remains a relevant reference against the present claims.

Appellant further argues that functional language as set forth in this claim cannot be ignored. However, Examiner has not ignored the functional language. Rather, Examiner has used Nishizaki et al. which teaches melt viscosity necessary to prevent faulty ejection and

clogging of ink jet printer heads when using hot melt inks which would teach or suggest to one of ordinary skill in the art to select the ink ingredients in Takazawa et al. so as to control the melt viscosity to 10-60 cPs in order to prevent faulty ejection and clogging of ink jet printer heads.

5. With respect to claim 6, which requires that the ink possess a specific conductivity, Appellant argues that there is no motivation to combine Takazawa et al. with Tobias et al. given that Takazawa et al. is drawn to ink for thermal transfer ribbons and pressure sensitive transfer ribbons, while Tobias et al. is drawn to an ink jet ink.

However, both Takazawa et al. and Tobias et al. are drawn to hot melt inks. Further, Tobias et al. disclose that hot melt inks with conductivity of 5.7-6.2 log(picomho/cm) have good adherence to a variety of substrates and yield printed images with increased smear resistance (col.2, line 55-col.3, line 30 and col.4, lines 20-23). Thus, it is the Examiner's position that there is motivation to combine Takazawa et al. with Tobias et al.

6. With respect to claim 9, which requires the use of specific amount of polystyrene, Appellant argues that there is no motivation to combine Takazawa et al. with Ball given that Takazawa et al. is drawn to ink for thermal transfer ribbons and pressure sensitive transfer ribbons, while Ball is drawn to an ink jet ink.

However, while Takazawa et al. and Ball disclose difference end uses for their ink, it is noted that both are drawn to hot melt ink as presently claimed. In light of this, and further given that Ball teaches using the same type of polymer, i.e. polystyrene, as presently claimed as well as disclosed by Takazawa et al., it is the Examiner's position that there is motivation to combine the references.

Appellant further argues that the burden of establishing a case of obviousness rests with the Examiner and that the Examiner may not make an assertion, unsupported by facts, of unpatentability, and require Appellant to provide evidence to rebut this assertion. Further, Appellant argues that Examiner has the burden under section 103 to establish a prima facie case of obviousness and that the burden is satisfied only by showing some objective teaching in the prior art or knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references, In re Fine, 5 USPQ2d 1596 (Fed. Cir. 1988).

However, it is the Examiner's position that given that both Takazawa et al. and Ball are drawn to hot melt ink comprising polystyrene and given that Ball teaches the use of specific amount of polystyrene in hot melt inks enhances adhesion of the ink to substrate, one of ordinary skill in the art would have been led to combine the teachings of the references.

In light of the above, it is clear that the Examiner has properly met the burden of establishing a prima facie case of obviousness, and thus, "the burden of coming forward with evidence or arguments shifts to the applicant who may submit additional evidence of non-

obviousness, such as comparative data showing that the claimed invention possesses improved properties not expected by the prior art." See MPEP 2142.

7. With respect to claim 10, which discloses several specific types of viscosity modifiers, Appellant argues (i) that there is no motivation to combine Yaegashi et al., Malhotra et al. '117, or Breton et al. '599 with either Takazawa et al. or Breton et al. '607 given that none of the references disclose combination of ingredients as presently claimed and (ii) there is no motivation to combine Wickramanayake with either Takazawa et al. or Breton et al. '607 given that Wickramanayake is drawn to liquid ink not hot melt ink as presently claimed.

While it is agreed that neither Yaegashi et al., Malhotra et al. '117, or Breton et al. '599 disclose combination of (a) styrene or terpene polymer, (b) nonpolymeric aromatic viscosity modifier, and (c) colorant as presently claimed, it is noted that Yaegashi et al., Malhotra et al. '117, or Breton et al. '599 are used as teaching references, and therefore, it is not necessary for these secondary references to contain all the features of the presently claimed invention, In re Nievelt, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), In re Keller 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather these references teach a certain concept, namely, compounds utilized in hot melt inks, and in combination with the primary reference, discloses the presently claimed invention. If the secondary reference contained all the features of the present claimed invention, it would be identical to the present claimed invention, and there would be no need for secondary references.

Appellant further argues that while Yaegashi et al., for instance, disclose the use of dibenzofuran, it is used as heat fusible substance not a viscosity modifier as presently claimed. However, regardless of what the compound is called, the fact remains that Yaegashi et al. disclose the use of dibenzofuran wherein such compound produces an ink with excellent storability that exhibits little blotting, and thus there is proper motivation to utilize the reference. While this motivation may not be the same motivation for using dibenzofuran as in the present invention, it is noted that obviousness under 103 is not negated because the motivation to arrive at the claimed invention as disclosed by the prior art does not agree with appellant's motivation. In re Dillon, 16 USPQ2d 1897 (Fed. Cir. 1990), In re Tomlinson, 150 USPQ 623 (CCPA 1996). In addition, given that Yaegashi et al. disclose dibenzofuran identical to that presently claimed, it would have been natural for one of ordinary skill in the art to infer that the dibenzofuran would intrinsically function as a viscosity modifier.

With respect to Wickramanayake, while it is agreed this reference is drawn to a liquid ink not a hot melt ink as presently claimed, it is noted that Wickramanayake is used as teaching reference and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, In re Nievelt, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), In re Keller 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, namely, compounds utilized in hot melt inks, and in combination with the primary reference, discloses the presently claimed invention. If the secondary reference

contained all the features of the present claimed invention, it would be identical to the present claimed invention, and there would be no need for secondary references.

Further, Appellant has provided no clear and convincing evidence that components present in liquid inks cannot be added to hot melt inks.

Additionally, evidence to support Examiner's position of the combination of Takazawa et al. or Breton et al.'607, each drawn to hot melt ink, with Wickramanayake, drawn to liquid ink, is found in Takazawa et al. which discloses the overlap between liquid ink and solid ink. (Note: As background information, it is noted that to one skilled in the art the terms "solid ink" and "hot melt ink" are equivalent). Appellant argues that Takazawa et al. is drawn to either liquid ink or solid ink and that there is no overlap between the two different inks. However, col.7, lines 65-68 of Takazawa et al. disclose that "conventional vehicles and others can be used without particular change.." which Examiner contends refers to the liquid inks previously mentioned by Takazawa et al. in col.6, lines 43-51. Appellant argues that the cited recitation in col. 7 refers to other conventional solid inks. However, it is noted that col.8, lines 1-6, 29-31 and col.9, line 48 of Takazawa et al. disclose that solid inks contain vehicle, colorant, dispersing agent, and phthalates which are also disclosed by Takazawa et al. as ingredients used in liquid ink. Thus, from Takazawa et al. it is concluded that there is some overlap with respect to the ingredients used in liquid ink and solid ink.

Appellant further argues that the burden of establishing a case of obviousness rests with the Examiner and that the Examiner may not make an assertion, unsupported by facts, of unpatentability, and require Appellant to provide evidence to rebut this assertion.

However, it is the Examiner's position that a case of obviousness has been established in light of the disclosure of Wickramanayake and that Examiner's assertion that liquid ink reference is combinable with solid ink reference is not unsupported. Rather, Takazawa et al. provides evidence to support Examiner's assertion. Finally, given that the Examiner has properly met the burden of establishing a prima facie case of obviousness, "the burden of coming forward with evidence or arguments shifts to the applicant who may submit additional evidence of non-obviousness, such as comparative data showing that the claimed invention possesses improved properties not expected by the prior art." See MPEP 2142.

8. With respect to Claim 15 which requires specific type of ink vehicle, Appellant argues that Shawcross et al. and Bruder et al. are each drawn to liquid ink not hot melt ink as presently claimed. Appellant further argues that the broad disclosures of Shawcross et al. and Bruder et al. do not meet the specific claimed ink vehicles.

While it is agreed that Shawcross et al. and Bruder et al. are each drawn to liquid ink, it is the Examiner's position that there is motivation to use these references for the same reasons as disclosed in paragraph 7 above regarding Wickramanayake, namely, that Shawcross et al. and Bruder et al. are only used as teaching references, Appellant has provided no clear

and convincing evidence that components present in liquid inks cannot be added to hot melt inks, and Takazawa et al.'s disclose of the overlap between liquid ink and solid ink.

Further, it is noted that Shawcross et al. and Bruder et al. broadly disclose tetrahydronaphthalene and carboxamide, respectively. Although there are no specific examples of tetrahydronaphthalene and carboxamide in either reference, one of ordinary skill in the art would have recognized that the broad disclosure of tetrahydronaphthalene and carboxamide encompasses the use of specific types of tetrahydronaphthalene and carboxamide including those presently claimed, and that the choice of these specific types of tetrahydronaphthalene and carboxamide would have been within the bounds of routine experimentation.

9. With respect to claim 17 which require specific types and amounts of dispersing agents, Appellant argues that there is no motivation to utilize JP 06228476 given that the Japanese reference is drawn to liquid ink not hot melt ink as presently claimed and no motivation to utilize Yaegashi et al. or Malhotra et al. '390 given that these references do not teach or suggest adding their disclosed compounds to hot melt ink comprising ingredients as presently claimed.

While it is agreed that JP 06228476 is a liquid ink, it is the Examiner's position that there is motivation to use this reference for the same reasons as disclosed in paragraph 7 above regarding Wickramanayake, namely, that JP 06228476 is only used as a teaching reference, Appellant has provided no clear and convincing evidence that components present in liquid

inks cannot be added to hot melt inks, and Takazawa et al.'s disclosure of the overlap between liquid ink and solid ink.

With respect to Yaegashi et al. or Malhotra et al. '390, while it is agreed that neither reference disclose combination of (a) styrene or terpene polymer, (b) nonpolymeric aromatic viscosity modifier, and (c) colorant as presently claimed, it is the Examiner's position that there is motivation to utilize these references for the same reasons as disclosed in paragraph 7 above regarding Yaegashi et al., Malhotra et al. '117, or Breton et al. '599, namely, Yaegashi et al. or Malhotra et al. '390 are only used as teaching references to teach the use of specific compounds in hot melt inks.

With respect to Yaegashi et al., Appellant states that Examiner argues that one of ordinary skill in the art would expect the dimethoxybenzaldehyde to function the same manner regardless of the position of the substituents. Appellant then discloses that this position is untenable given that 2,3-dimethoxybenzaldehyde has a melting point of 48^0-52^0 C and boiling point of 137^0 C, while 2,6-dimethoxybenzaldehyde has melting point of 96^0-98^0 C and boiling point of 285^0 C.

However, it is noted that in light of this argument, originally set forth in Appellant's amendment filed 7/20/00, Paper No.5, Examiner dropped this argument with respect to Yaegashi et al. in the following office action mailed 10/10/00, Paper No. 6

10. Appellant also argues that Examiner's rejections are based on hindsight. Citing case law such as In re Geiger, 2 USPQ2d 1276 (Fed. Cir. 1987), appellant further argues that obviousness cannot be established by combining references to arrive at the claimed invention absent some teaching, suggestion, or incentive supporting the combination and citing Uniroyal Inc. v. Rudkin Wiley Corp., _F.2d_, 5 USPQ2d 1435 (Fed. Cir. 1988), appellant argues that when prior art references require selective combination to render obvious a subsequent invention, there must be some reason for the combination other than hindsight gleaned from the invention itself.

However, it is the Examiner's position that there is some teaching, suggestion, or incentive to combine the references and that the combinations of references are not based on hindsight gleaned from the present invention, given that the examiner has provided motivations to combine the references, all the references are from the same general field of endeavor, i.e. inks, or in some cases the same field of endeavor, i.e. hot melt inks, and that the references when combined meet the claimed invention.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Vasu Jagannathan

VASU JAGANNATHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

C.S.

Callie Shosho
October 19, 2001

John E Beck
Xerox Corporation
Xerox Square 20A
Rochester, NY 14644

Appeal Conferees:

Robert Dawson

Robert Dawson SPE 1712

Vasu Jagannathan

Vasu Jagannathan, SPE, Art Unit 1714